

## Mini-Treadmill for Musculoskeletal Health, Phase II

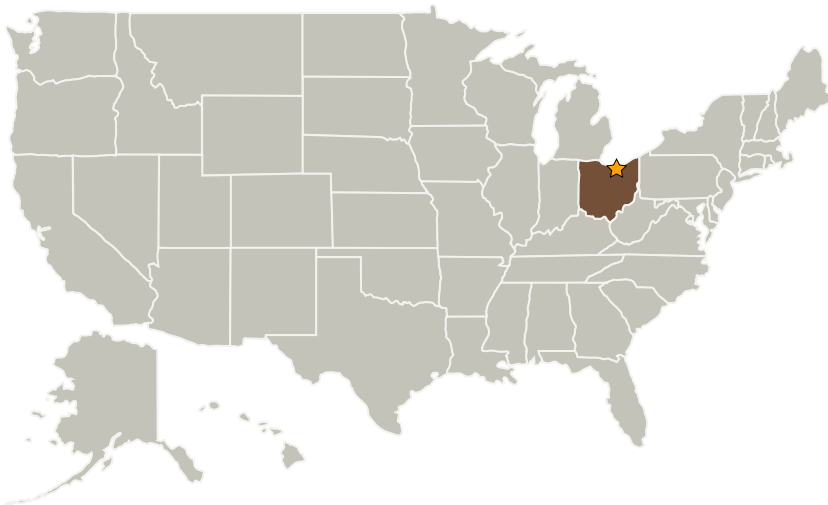
Completed Technology Project (2007 - 2009)



## Project Introduction

ZIN Technologies, Inc. is developing a novel Miniature Treadmill with resistive exercise capability for use in spaceflight exercise countermeasures and broad terrestrial therapeutic applications. The treadmill offers excellent periodic impact exercise to stimulate bone remodeling and cardiovascular activity as well as an added component of resistive exercise to encourage all-body muscle maintenance. The goal of this project is to demonstrate by design and analysis that the proposed treadmill will satisfy the stringent volumetric, power, and performance requirements demanded by lunar missions and provide the active feedback necessary to control the treadmill and display Daily Load Stimulus (DLS). We are additionally developing a new novel speed control algorithm in which the runner can modulate the treadmill speed through adjusting their stride. A new subject load device is being developed for use in providing a more earthlike gravity replacement load to astronauts during spaceflight. We along with our partner the Cleveland Clinic believe that a hybrid compact exercise device along with the direct feedback of DLS is a unique and new approach that will provide a superior in space exercise system than ones currently in use on ISS.

## Primary U.S. Work Locations and Key Partners

Mini-Treadmill for  
Musculoskeletal Health, Phase II

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Organizational  
Responsibility**Responsible Mission  
Directorate:**Space Technology Mission  
Directorate (STMD)**Lead Center / Facility:**

Glenn Research Center (GRC)

**Responsible Program:**Small Business Innovation  
Research/Small Business Tech  
Transfer

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Organizations Performing Work	Role	Type	Location
★ Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
ZIN Technologies Inc.	Supporting Organization	Industry Small Disadvantaged Business (SDB)	Middleburg Hts, Ohio

## Primary U.S. Work Locations

Ohio

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

## Technology Areas

**Primary:**

- TX06 Human Health, Life Support, and Habitation Systems
  - └ TX06.3 Human Health and Performance
    - └ TX06.3.2 Prevention and Countermeasures